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In one respect the volume falls short of what it might have been. Little or no attention is given to the phylogeny of tissues and while this aspect of the subject is necessarily chiefly theoretic, a broadly grounded treatment cannot afford to omit it. Aside from this the volume is most acceptable. The presswork is excellent and the numerous figures, many of which are in color, afford a most ample body of illustrations for the text. There is a very full table of contents and an excellent index.

G. H. P.

Studies in Heterogenesis.¹—One hundred years ago, Oken believed he had evidence that animal and vegetable tissues disintegrate after death to give rise by rearrangement of their elementary parts to minute living things which combine in larger and larger aggregates to form the myriads of infusion-dwelling microscopical organisms. Such an hypothesis is excusable with Oken in 1805, but in 1905, after more than sixty years of cell study, — after complete establishment of the dictum *omnis cellula e cellula*, the limit of toleration is overreached and we read with ever growing impatience the mass of so called evidence that dead protoplasmic substance is directly metamorphosed into living organisms of diverse species, genera, and even kingdoms.

This "evidence" is beautifully presented in 350 pages of letter press, with an appendix of 35 pages, and with 815 illustrations from microphotographs, by which, as the author tells us, the careful student can "help to break down the barrier of incredulity which at present excludes any general acceptance of the truth and universality of those processes of heterogenesis by means of which, as I believe, the lower forms of life, both animal and vegetal, are ever springing up anew in countless myriads from matrices wholly unlike themselves" (page 3). The photographs are fairly well taken and illustrate many common forms in stagnant waters but to present them as proof of heterogenesis recalls the *naïveté* of the small boy offering his pole and line as evidence of the ten-pound bass that escaped his hook.

Without going too much into details here, we may sum up the author's point of view by the following results which he believes are proved by his "evidence":—

1. Aggregates of bacteria in the zoöglœa stage may be transformed into fungus germs, or into Amœbæ, Mastigophora, or even into ciliated Infusoria (pp. 65–108).

¹ Bastian, H. C. *Studies in Heterogenesis*. London, Williams and Norgate, 1903. 8vo, ix + 354 + xxxvii pp., 19 pls. 31/6.

2. Ciliated Protozoa may be formed indifferently from such zoöglæa masses, or from the substance of Amœbæ (pp. 113-118), or from encysted Euglena (pp. 110-113), or from the eggs of Macrobiotus (pp. 138-144) and rotifers (pp. 44-45).

3. Diatoms, even, may arise *de novo* from the cells of a parasitic alga (pp. 158-168); or Actinophrys from the substance of Nitella cells, or from Euglena (p. 224). The latter, indeed, seems to be something of a protoplasmic Pandora's box from which emerge Peranema (p. 13), Polyphagus (p. 224), Olpidium (p. 226), Chytridium (p. 232), Chlamydomonas (p. 234), Amœba (p. 235), or higher algæ like Vaucheria (p. 188) and Conferva (p. 191), while its own protoplasm may be only the metamorphosed substance of an algal cell (Edogonium).

As to the method employed in obtaining these remarkable findings there is little said; isolation and continuous observation were deemed unnecessary and fruitless. Tap water with hay for example, was heated to not more than 125° F. and left to stand. A scum developed after a few days, in which, from day to day, various types of organisms, including monads, fungus germs, Actinophrys, and even ciliates were observed, all having developed, he concluded, from "embryonal areas" of the scum. These observations are seriously presented as proving the heterogenetic origin of the different forms. Answering a criticism from certain "learned societies" that had refused to accept his conclusions based upon this method of observation, Bastian states: "I submit that such evidence as has been brought forward in this volume is the only kind of evidence that can be adduced in proof of heterogenesis" (p. 344), and this statement, if limited to his use of the term heterogenesis, is one and the only one in which we heartily and unqualifiedly agree with the author.

G. N. C.

Herrick's Home Life of Wild Birds.¹—In the four years since the appearance of Professor Herrick's earlier work under this title, he has been able to extend his studies of nesting habits to a larger number of species and individuals, and in the present revised edition of his book "much has been re-written, and forty-eight new illustrations have been added to the text in place of a smaller number omitted. The first three chapters have been materially changed;

¹Herrick, Francis H. *The Home Life of Wild Birds. A New Method of the Study and Photography of Birds.* New York and London, G. P. Putnam's Sons, 1905. 8vo, xxv + 225 pp., illus. \$2.00.